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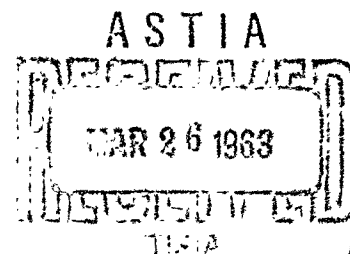
AN OUTBREAK OF ANTHRAX ALONG THE ARZAMAS - GORKY CATTLE DRIVING TRAIL

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AN OUTBREAK OF ANTHRAX ALONG THE ARZAMAS-GORKY

CATTLE-DRIVING TRAIL

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The absence of works in Soviet and foreign literature on anthrax outbreaks among farm animals and humans along cattle-driving trails or references to this possibility in official instructions and regulations on anthrax have naturally made many doctors and veterinaries responsible for planning antianthrax measures to forget cattle-driving trails and their potential epidemic danger. Familiarity with the causes of the outbreak along the Arzamas-Gorky trail may help medical technicians to revise their methods of preventing the disease.

The Pochinki-Lukyanovo-Arzamas-Gorky cattle-driving trail, more than 200 km long, served 13 rayons in the oblast. Many herds of cattle had passed over it prior to the anthrax outbreak. During 13 days in July 1960 some 2300 head of cattle passed over the trail from Dal'ne-Konstantinov rayon alone, and 14 herds from seven rayons (Lukyanov, Shatkov, Gagin, Badskiy, Dal'ne-Konstantinov, Perevoz, and Arzamas) numbering 4500 animals were on a small section of the trail (Sarley-Gorky) at the time the outbreak was detected.

Cases of anthrax among animals or humans have been recorded every year except 1956. Most cattle deaths took place in 1953 (12), 1959 (7), and 1957 (6). Lukyanov, Gagin, and Dal'ne-Konstantinov were the most infected rayons, accounting for about 50% of all the cases among humans and more than 66% among animals. One animal each died of anthrax in the settlements of Sarley, M. Teryushevo, and Tamozhnikovo in Dal'ne-Konstantinov rayon, as was discovered in the course of an epidemiological investigation in 1960.

The outbreak of anthrax among cattle along the Arzamas-Gorky trail, which began early in August 1960, was confirmed only on August 8th when a suspected cow from herd No. 2 was slaughtered at primary cattle processing plant No. 2. Despite the suspicions that were

aroused, the veterinaries failed to halt the slaughtering of animals, thereby preventing the causative agent from infecting a large batch of meat (about 50 tons). The meat should have been destroyed, work at the plant discontinued, and movement of cattle along the trail halted.

An epidemiological investigation revealed that the initial cases were detected somewhat earlier, on August 4th, when a cow from herd No. 3 died of anthrax near the village of Zubanikha. On the following days more cases were detected in 8 out of 13 herds moving along the trail in back of herds Nos. 2 and 3, on August 6th -- in herd No. 13, on August 9th -- in herds Nos. 7, 8, and 14, on August 10th -- in herd No. 4, on August 11th -- in herds Nos. 7 and 12, on August 14th -- in herd No. 11, and on August 15th -- in herd No. 15. A total of 56 animals died on the trail or in plant No. 2. Herds Nos. 2, 4, and 8 were most affected, 31 animals dying, or more than 50% of the total loss. No cases of the disease were found in herds Nos. 1, 5, 6, 9, and 10.

Analysis of the epizootological report reveals that the first cases in herds Nos. 2 and 3 may have occurred in the pastures of the Sarley rural council of Dal'ne-Konstantinov rayon where a non-vaccinated sheep had died of anthrax not too long before (July 10, 1960). Additional evidence is the fact that the first death of a cow took place two or three days after the herds passed through the territory of the Sarley rural council. There is also the possibility that the pastures were infected by herds that had previously passed through since roads to Gorky converge there from several rayons of the oblast. Cattle from herd No. 12 could have become infected in the village of Tatarskoye, where an animal had died of anthrax early in August. Cattle from the other herds may well have become infected anywhere along the trail from the village of Sarley to Mitino, where cattle from Nos. 2, 3, 12, and other herds died.

Bacteriological investigations were made of 48 animals since measures were instituted to halt the outbreak, cultures of the anthrax rod being isolated in 13 cases.

The epidemiological characteristics of 9 cases of the cutaneous form in humans recorded between August 9 and 26 were very clear. In 7 cases the infection resulted from handling or slaughtering animals along the Arzamas-Gorky trail, in 2 cases it developed from contact with a sick animal at plant No. 2.

The anthrax patients included 7 herdsmen and 2 workers in plant No. 2. There were 8 males and 1 female, 8 of them between 20 and 39 years of age, 1 over 40. Two were hospitalized on the 3rd day of illness, 5 on the 4th-5th day, 2 after the 5th day.

Carbuncles were localized on the forearm of 7 patients, on the wrist in 1, and on the back in 1. None of the patients had ever been vaccinated against anthrax. Neither were the persons hired specifically to drive the cattle or the regular workers in the Gorky meat plant vaccinated.

With one exception all the patients had the disease in a mild form because they were given antianthrax serum (25 to 40 ml) in the incubation period.

The reasons for the relatively late hospitalization of the patients are the inefficient organization of efforts to discover such persons (the herdsmen were not all given careful physical examinations), mild course of the disease, and, prior to the outbreak, lack of medical attention while on the trail.

Technicians Bogdanova and Pryazhnikov of the Gorky Institute of Epidemiology and Hygiene made the laboratory tests on August 12th while Shurkina of the Saratov Research Institute of "Microbes" did so after August 16th. A bacteriological analysis was made of material from the first six patients. Smears from the investigated material from three patients were found to contain large, gram-positive rods morphologically similar to the causative agent of anthrax; many of them were changed. No culture of the anthrax microbe was obtained from any of the patients.

All the steps taken to halt the outbreak were in accordance with a comprehensive plan approved by the oblast executive committee. They consisted chiefly of: (a) passive and active immunization of all the cattle (4700 head) in quarantine along the trail; (b) active detection (daily thermometry of all the cattle) of sick animals and those suspected of having anthrax, isolating and treating them with serum and antibiotics; (c) routine disinfection and burning of carcasses of dead animals on the spot.

Similar steps were taken in regard to the people handling the animals (herdsmen, drivers, and veterinaries). All herdsmen and drivers were subjected to complete medical processing after preliminary physical examination. This processing was later carried out once a week. The necessary quantity of underclothes and towels was set aside for this purpose. Then the entire group along with the workers in meat plants Nos. 1 and 2 were passively immunized. Serum was injected, as noted above, in 25 to 40 ml amounts. Several days later these persons as well as the population of the villages located near the stopping places of the infected herds were vaccinated with STI vaccine. During the outbreak 612 persons were passively immunized and 8000 persons vaccinated. At the same time an active search was conducted among those handling the cattle to find (through physical examination and

thermometry) and hospitalize those suspected of having the disease. A good deal of health propaganda was carried out.

Plant No. 2, where sick animals died or were slaughtered, was carefully disinfected (wooden tools and equipment of little value were burned) and new sanitary arrangements were made in the work places and grounds of the plant. The entire area was disinfected twice and paved with two layers of asphalt.

The principal cause of the outbreak was that the heads of the agencies responsible for procurement of meat did virtually nothing to ensure healthful conditions along the Pochinki-Lukoyanovo-Arzamas-Gorky cattle-driving trail and the veterinary services failed to show the necessary initiative in this matter. For example, an epidemiological and epizootological investigation of the outbreak revealed that only a few animals had been vaccinated against anthrax. According to veterinary certificates in the possession of 14 herdsmen, only 3 herds (but not the young steers) were vaccinated; in the Krasnyy Partizan kolkhoz (Tatarskoye, Beksheyevo, Sesikino) 780 animals were vaccinated, whereas there were 1240 head in two inhabited localities alone.

Even such an important measure as a 15-day quarantine of infected places was not always instituted. A cow that died on July 9th in Tamozhnikovo, Dal'ne-Konstantinov rayon, was dissected at the suggestion of a veterinary feldsher. The owner of the cow and his sister who dissected the animal contracted the disease. The diagnosis was based on a bacteriological examination and the clinical course of the disease. Yet no quarantine was instituted and the Dal'ne-Konstantinov rayon meat procurement office purchased cattle in the rayon (Tamozhnikovo, Polera, Belaya) and on July 23rd sent 53 cows to Gorky. On July 29th and August 4th, 7 weak animals from the same herd were sent by truck to Gorky.

Veterinary inspection of cattle in the rayon cattle procurement offices was cursory, including haphazard measurement of temperature. In the Dal'ne-Konstantinov rayon cattle procurement office the doctor's post had been vacant a long time and a veterinary feldsher performed the various sanitary duties for a small fee. As a result sick and weak animals often died and they had to be delivered to the plant by truck or slaughtered on the trail. Eighty-two animals from 8 herds were transported by truck or slaughtered.

The herdsmen were not always given clear itineraries before leaving the assembly points. Thus, they had to use their own judgment on the routes to take. They undoubtedly had no knowledge of the epizootological situation in the inhabited localities along the way so that they couldn't take it into account when selecting the routes.

It was a common practice to slaughter sick or weak animals without authorization of a veterinary and without observance of the most elementary rules of personal hygiene. The herdsmen were not familiar with what to do in case any of the animals became sick or weak nor were they told what veterinary agencies they might apply to en route for medical aid in case of necessity.

Personnel were selected to handle the cattle in violation of labor legislation. About 20% of the drivers were youngsters 16 years of age or less. They were not vaccinated against anthrax or given information on how to avoid contracting the disease.

None of the 14 herds was inspected by a veterinary en route, as shown by the absence of appropriate markings on the reverse side of the veterinary certificates. Such inspection would have quickly resulted in discovery of the sick animals and localization of the disease. But no such veterinary control points were set up along the Pochinki-Lukoyanovo-Arzamas-Gorky cattle-driving trail, probably because the veterinaries failed to appreciate the importance of cattle-driving trails in the epizootology of anthrax.

The area in which animals died or were slaughtered was not disinfected and this naturally resulted in infection of newer portions of the trail.

Cattle were unloaded at plant No. 2 and inadequately inspected in gross violation of existing regulations. The animals were not accepted individually from the herd list and metal tags. They were accepted by weight and number of heads; their temperature was not always taken before slaughter. This raises the justifiable question of whether herd lists and metal tags, the preparation of which takes much effort and time on the part of the rayon cattle procurement offices, are necessary. And doesn't such a way of receiving cattle result in marked deterioration of their epizootological condition because healthy, well nourished animals could be exchanged for sick or weak ones en route?

The anthrax outbreak on the Arzamas-Gorky cattle-driving trail, which resulted in the death of animals and mass infection of people, inflicted a heavy financial loss on the oblast's economy. It was caused by shortcomings and errors committed at the time of mass procurement of meat by state agencies.

FINDINGS

1. Cattle-driving trails, especially at a time of large-scale state procurement of meat without observance of sanitary-veterinary measures in force, may be the scene of mass outbreaks of anthrax among cattle and human beings.

2. The creation of epizootologically and epidemiologically healthy conditions on cattle-driving trails requires that national economy councils, in conjunction with representatives of the veterinary service and oblast (krai, republic) sanitary-epidemiological station, plan annual programs for prevention of anthrax on each trail individually and set up an efficient organization to check on their implementation.

3. In cases where there is no assurance of epizootologically healthy conditions along the cattle-driving trails, arrangements should be made for the cattle to be brought from rayon meat procurement offices to meat processing or packing plants by water, rail, or truck transport.

4. The plans of state meat procurement agencies should take careful cognizance of the capacity of the meat processing and packing plants in order to prevent overloading of these plants and ensuing deterioration in sanitary conditions.

5. The current instructions on anthrax should be expanded to include a special section on the organization of antiepidemic and antiepzootic measures on cattle-driving trails.

SUMMARY

Analysis of the outbreak of anthrax among animals and humans along the Arzamas-Gorky cattle-driving trail (in the Russian Republic) in August 1960 revealed that it was due to inefficiency and neglect by the local veterinary services. Many of the herdsmen were young and inexperienced in the work, and few had been vaccinated. Increasing activity in the area is likely to bring about even more severe outbreaks unless proper prophylactic measures are taken in time.



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